DESCRIPTIVE MODEL OF DIAMOND PLACERS

By Dennis P. Cox

DESCRIPTION Diamonds in alluvial and beach sediments and in sandstone and conglomerate.

GENERAL REFERENCES Orlov (1973), Lampietti and Sutherland (1978).

GEOLOGICAL ENVIRONMENT

Rock Types Sand and gravel alluvial and beach deposits. Conglomerate beds may contain paleoplacers.

Textures Coarse elastic.

Age Range Tertiary and Quaternary.

Depositional Environment Streams draining areas of kimberlites pipes or diamond concentrations in sedimentary or metamorphic rocks. Alluvial diamond deposits may be 1,000 km from source. It is possible that some diamonds may have been derived from Archean greenstone belts.

Tectonic Setting(s) Stable craton.

Associated Deposit Types Diamond pipes.

DEPOSIT DESCRIPTION

Mineralogy Diamond, bort or carbonado (polycrystalline, generally dark colored), ballas (spherulitic, polycrystalline and amorphous carbonado).

Texture/Structure Diamonds derived from ancient placers in sedimentary rock commonly retain sand grains cemented to grooves or indentations in the crystal.

Ore Controls Diamonds are concentrated in low-energy parts of stream systems with other heavy minerals. Diamonds decrease in size and increase in quality (fewer polycrystalline types) with distance from their source.

Geochemical Signature Cr, Ti, Mn, Ni, Co, PGE, Ba. Anomalous Ni and Nb together with the heavy minerals pyrope, Mg-ilmenite, and phlogopite indicate nearby kimberlites pipes.

EXAMPLES

African deposits	(Sutherland, 1982)
Venezuelan deposits	(Fairbairn, 1971; Reid and Bisque, 1975)